

Technology Offer:

## Connector for Electrically Connecting Conductors in a Superconducting Condition

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The connector apparatus incorporates a unique design that allows two or more conductor devices to contact directly, ensuring zero-resistance connections under superconducting conditions. This is facilitated by a pivoting pressing clamp mechanism, which when engaged, applies precise contact pressure to overlapping conductor sections housed within a specially designed connector receptacle. This innovative configuration is critical for applications requiring minimal electrical resistance and high reliability.

### Advantages

- **Zero Electrical Resistance:** Maintains superconducting state with no measurable resistance.
- **Robustness:** Withstands repeated thermal cycles without loss of functionality, ensuring long-term reliability.
- **Simplicity and Reliability:** The pressing clamp mechanism is straightforward, reducing assembly time and potential errors.
- **Cost-Effective:** Reduces the need for frequent replacements and maintenance.

### Applications

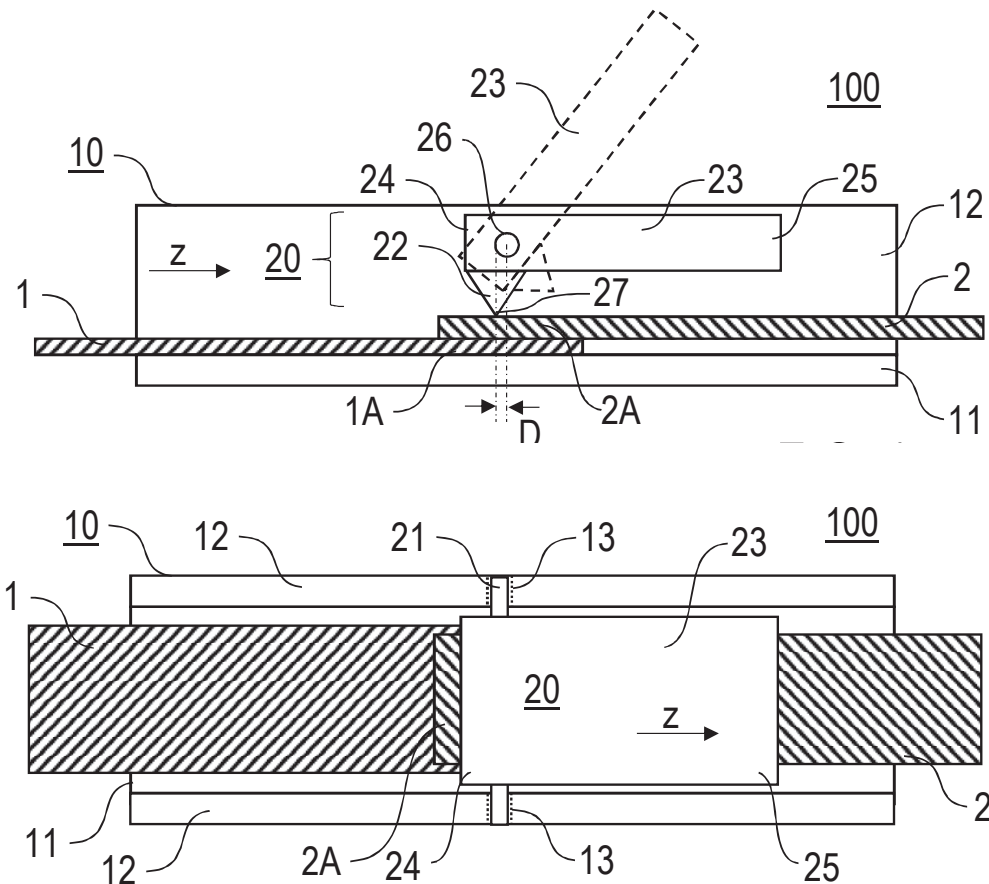
- **Cryogenic Systems:** Ideal for use in environments operating at cryogenic temperatures.
- **Quantum Computing:** Enabling reliable interconnections between qubits or other quantum computing elements.
- **Medical Imaging:** Applicable in MRI systems or other medical imaging technologies that require superconducting components.
- **Aerospace:** Suitable for applications in space exploration where durable and efficient superconducting circuits are necessary.

### Background

Conventional connectors in superconducting circuits often face challenges such as maintaining zero electrical resistance and mechanical stability at very low temperatures. As superconducting technology becomes integral to advancements in quantum computing, medical imaging, and aerospace, there is an increasing demand for connectors that can reliably operate under these extreme conditions without performance degradation.

## Technology

A schematic of the novel connector (100) is shown in the below figures. The connector comprises a connector receptacle (10) and a pivotable pressing clamp (20), which together facilitate a direct, zero-resistance electrical contact between superconducting conductors (1, 2). This is achieved through an innovative clamp mechanism that presses overlapping conductor sections (1A, 2A) against a base portion (11) in the connector receptacle, ensuring a secure and stable connection that can be easily engaged or disengaged. The connector is designed to work efficiently below 10K, making it suitable for extremely low-temperature operations. Its compact and robust design allows for easy integration into existing superconducting systems, providing an optimal solution for seamless electrical transitions.



For this technology a patent application (PCT) has been filed on January 29, 2024. The technology is available for licensing.

## Contact

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